REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 1, 3, 11, 15, 18, 23, 25, 32, 35, 39, 44, and 48 are amended. New claims 58-60 are added. Claims 1-60 are pending in this application.

Allowed Claims

Claims 51-57 stand allowed.

Claims 3, 4, 11-14, 18-20, 25-27, 35-37, and 48-49 stand objected to as being dependent upon a rejected base claim. As part of this response, claim 3 has been rewritten to incorporate its base claim (claim 1), claim 11 has been rewritten to incorporate its base claim (claim 1), claim 18 has been rewritten to incorporate its base claim (claim 15), claim 25 has been rewritten to incorporate its base claim (claim 23), claim 35 has been rewritten to incorporate its base claim (claim 32), and claim 48 has been rewritten to incorporate its base claim (claim 44) and intervening claim (claim 47). Thus, Applicant respectfully submits that claims 3, 11, 18, 25, 35, and 48 are now in condition for allowance.

Given that claim 4 depends from claim 3, claims 12-14 depend from claim 11, claims 19-20 depend from claim 18, claims 26-27 depend from claim 25, claims 36-37 depend from claim 35, and claim 49 depends from claim 48, Applicant respectfully submits that claims 4, 12-14, 19-20, 26-27, 36-37, and 49 are now in condition for allowance.

35 U.S.C. § 103

Claims 1, 2, 5-10, 15-17, 21-24, 28-34, 38-47, and 50 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,078,701 to Hsu et al. (hereinafter "Hsu"). Applicant respectfully submits that claims 1, 2, 5-10, 15-17, 21-24, 28-34, 38-47, and 50 are not obvious over Hsu.

Hsu is directed to systems that combine multiple still pictures and/or video frames to form a panoramic representation of an extended scene (see, col. 1, lines 14-17). The system of Hsu combines a plurality of source images into a seamless panoramic mosaic representation of a scene, regardless of the order of image acquisition (see, col. 4, lines 40-44). These mosaics of Hsu are created by assembling together closely spaced registered strips of images (see, col. 18, lines 17-19).

In contrast, amended claim 1 recites (in part):

> identifying a plurality of viewing rays to be used to construct, based on a previously captured mosaic, a view image of a scene represented by the mosaic;

Applicant respectfully submits that, as discussed above, Hsu is directed to generating a mosaic, not constructing, based on a previously captured mosaic, a view image of a scene represented by the mosaic as claimed in amended claim 1. Applicant respectfully submits that the combining of multiple pictures and/or frames into a seamless panoramic mosaic representation of a scene regardless of the order of image acquisition as described in Hsu does not disclose or suggest the construction of the view image based on the previously captured mosaic as claimed in amended claim 1.

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For at least these reasons, Applicant respectfully submits that amended claim 1 is allowable over Hsu.

With respect to amended claim 23, Applicant respectfully submits that, analogous to the discussion above regarding amended claim 1, Hsu does not disclose or suggest generating, from a mosaic and based on a plurality of viewing rays, a plurality of image values for a view of a scene as recited in amended claim 23. For at least these reasons, Applicant respectfully submits that amended claim 23 is allowable over Hsu.

With respect to amended claim 32, Applicant respectfully submits that, analogous to the discussion above regarding amended claim 1, Hsu does not disclose or suggest a view renderer to generate values based on a previously captured mosaic for a portion of an image of a scene represented by the mosaic as recited in amended claim 32. For at least these reasons, Applicant respectfully submits that amended claim 32 is allowable over Hsu.

With respect to amended claim 15, amended claim 15 is directed to a method of generating values for a portion of an image of a scene represented by concentric mosaics to be rendered. Applicant respectfully submits that the mere disclosure of a mosaic in Hsu does not disclose or suggest concentric mosaics as recited in amended claim 15. Applicant respectfully submits that there is no discussion in Hsu of concentric mosaics, and thus that Hsu does not disclose or suggest a method of generating values for a portion of an image of a scene represented by concentric mosaics to be rendered as recited in amended claim 15. For at least these reasons, Applicant respectfully submits that amended claim 15 is allowable over Hsu.

With respect to amended claim 39, Applicant respectfully submits that, analogous to the discussion above regarding amended claim 15, Hsu does not disclose or suggest accessing concentric mosaics of a scene that are a sequence of images as recited in amended claim 39. For at least these reasons, Applicant respectfully submits that amended claim 39 is allowable over Hsu.

With respect to amended claim 44, Applicant respectfully submits that, analogous to the discussion above regarding amended claim 15, Hsu does not disclose or suggest a view renderer to generate, based on a viewpoint and direction of viewing, a pair of rendered view images of a scene, wherein the scene is represented by concentric mosaics as recited in amended claim 44. For at least these reasons, Applicant respectfully submits that amended claim 44 is allowable over Hsu.

Given that claims 2 and 5-10 depend from amended claim 1, claims 16, 17, 21, and 22 depend from amended claim 15, claims 24 and 28-31 depend from amended claim 23, claims 33, 34, and 38 depend from amended claim 32, claims 40-43 depend from amended claim 39, and claims 45-47 and 50 depend from amended claim 44, Applicant respectfully submits that claims 2, 5-10, 16, 17, 21, 22, 24, 28-31, 33, 34, 38, 40-43, 45-47, and 50 are likewise allowable over Hsu for at least the reasons discussed above.

Applicant respectfully requests that the §103 rejections be withdrawn.

New Claims

New claims 58 – 60 are added.

With respect to new claim 58, new claim 58 depends from amended claim 1 and Applicant respectfully submits that new claim 58 is allowable over the cited references due to its dependency on amended claim 1. Furthermore, Applicant respectfully submits that the cited references do not disclose or suggest one or more computer-readable media as recited in claim 1, wherein the identifying comprises identifying a plurality of viewing rays to be used to construct, based on previously captured concentric mosaics, a view image of a scene represented by the concentric mosaics as recited in new claim 58. For at least these reasons, Applicant respectfully submits that new claim 58 is allowable over the cited references.

With respect to new claim 59, new claim 59 depends from amended claim 23 and Applicant respectfully submits that new claim 59 is allowable over the cited references due to its dependency on amended claim 23. Furthermore, Applicant respectfully submits that the cited references do not disclose or suggest a method as recited in claim 23, wherein the generating comprises generating, from concentric mosaics and based on a plurality of viewing rays, a plurality of image values for a view of a scene as recited in new claim 59. For at least these reasons, Applicant respectfully submits that new claim 59 is allowable over the cited references.

With respect to new claim 60, new claim 60 depends from amended claim 32 and Applicant respectfully submits that new claim 60 is allowable over the cited references due to its dependency on amended claim 32. Furthermore, Applicant respectfully submits that the cited references do not disclose or suggest a system as recited in claim 32, wherein the view renderer is to generate values

based on previously captured concentric mosaics for the portion of the image of the scene represented by the concentric mosaics as recited in new claim 60. For at least these reasons, Applicant respectfully submits that new claim 60 is allowable over the cited references.

Conclusion

Claims 1-60 are in condition for allowance. Applicant respectfully requests reconsideration and issuance of the subject application. Should any matter in this case remain unresolved, the undersigned attorney respectfully requests a telephone conference with the Examiner to resolve any such outstanding matter.

Respectfully Submitted,

Date: 7/31/02

By: _____
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Version of Claims with Markings to Show Changes Made

1.   (Amended)   One or more computer-readable media having stored thereon a computer program that, when executed by one or more processors of the computer, causes the one or more processors to perform acts including:

identifying a plurality of viewing rays to be used to construct[ed], based on a previously captured mosaic, a view image of a scene represented by [a] the mosaic;

checking whether each of the plurality of viewing rays coincides with at least a portion of a captured image;

for each viewing ray that coincides with at least a portion of a captured image, selecting the portion of the captured image;

for each viewing ray that does not coincide with at least a portion of a captured image, generating an interpolated portion by interpolating between at least two portions of one or more captured images based on a constant distance to objects in the scene; and

combining the selected and interpolated portions to generate the view image.

3.   (Amended)   One or more computer-readable media [as recited in claim 1] having stored thereon a computer program that, when executed by one or

more processors of the computer, causes the one or more processors to perform acts including:

identifying a plurality of viewing rays to be used to construct a view image of a scene represented by a mosaic;

checking whether each of the plurality of viewing rays coincides with at least a portion of a captured image;

for each viewing ray that coincides with at least a portion of a captured image, selecting the portion of the captured image;

for each viewing ray that does not coincide with at least a portion of a captured image, generating an interpolated portion by interpolating between at least two portions of one or more captured images based on a constant distance to objects in the scene, wherein the constant distance is calculated based on both a first distance between a center of capture rotation and a nearest object of the scene and a second distance between the center of capture rotation and a farthest object of the scene; and

combining the selected and interpolated portions to generate the view image.

11.   (Amended)   One or more computer-readable media [as recited in claim 1, wherein the scene is] having stored thereon a computer program that, when executed by one or more processors of the computer, causes the one or more processors to perform acts including:

identifying a plurality of viewing rays to be used to construct a view image of a scene represented by a set of concentric circle mosaics based on a set of concentric circles;

checking whether each of the plurality of viewing rays coincides with at least a portion of a captured image;

for each viewing ray that coincides with at least a portion of a captured image, selecting the portion of the captured image;

for each viewing ray that does not coincide with at least a portion of a captured image, generating an interpolated portion by interpolating between at least two portions of one or more captured images based on a constant distance to objects in the scene; and

combining the selected and interpolated portions to generate the view image.

15.   (Amended) A method of generating values for a portion of an image of a scene represented by [a] concentric mosaics to be rendered, the method comprising:

interpolating between at least a portion of each of two or more captured images based on a constant distance to objects in the scene.

18.   (Amended) A method [as recited in claim 15] of generating values for a portion of an image of a scene represented by a mosaic to be rendered, the method comprising:

interpolating between at least a portion of each of two or more captured images based on a constant distance to objects in the scene, wherein the scene is represented by a set of concentric circle mosaics.

23.   (Amended) A method comprising:

generating, from a mosaic and based on a plurality of viewing rays, a plurality of image values for a view of a scene [represented by a mosaic];

using, as a first set of image values for the view, at least a portion of a captured image; and

using, as a second set of image values for the view, interpolated values generated by interpolating between at least two portions of one or more captured images based on a constant distance to objects in the scene.

25.   (Amended) A method [as recited in claim 23, wherein the scene is] comprising:

generating, based on a plurality of viewing rays, a plurality of image values for a view of a scene represented by a set of concentric circle mosaics based on a set of concentric circles;

using, as a first set of image values for the view, at least a portion of a captured image; and

using, as a second set of image values for the view, interpolated values generated by interpolating between at least two portions of one or more captured images based on a constant distance to objects in the scene.

32. (Amended) A system comprising:

an observer interface to receive user input commands and identify a viewpoint and a direction of viewing based on the input commands; and

a view renderer, communicatively coupled to the observer interface, to receive the viewpoint and the direction of viewing, to generate values based on a previously captured mosaic for a portion of an image of a scene represented by [a] the mosaic, and to interpolate between at least two captured images based on a constant distance to objects in the scene.

35. (Amended) A system [as recited in claim 32, wherein the scene is] comprising:

an observer interface to receive user input commands and identify a viewpoint and a direction of viewing based on the input commands; and

a view renderer, communicatively coupled to the observer interface, to receive the viewpoint and the direction of viewing, to generate values for a portion of an image of a scene represented by a set of concentric circle mosaics based on a

set of concentric circles, and to interpolate between at least two captured images based on a constant distance to objects in the scene.

39.   (Amended)   One or more computer-readable media having stored thereon a computer program that, when executed by one or more processors of the computer, causes the one or more processors to perform acts including:

accessing concentric mosaics of a scene that are a sequence of images captured by moving a camera in a path around a point, the sequence of images including a plurality of image data, each having a ray direction associated therewith;

identifying a left viewpoint and a right viewpoint within a circle defined by the movement of the camera around the point;

obtaining left image data from the sequence of images that has a ray direction substantially aligned with the ray direction from the left viewpoint;

obtaining right image data from the sequence of images that has a ray direction substantially aligned with the ray direction from the right viewpoint;

creating a portion of a left image as seen from the left viewpoint by using the obtained left image data; and

creating a portion of a right image as seen from the right viewpoint by using the obtained right image data.

44.   (Amended) A system comprising:

an observer interface to receive user input commands and identify a viewpoint and viewing direction based on the input commands; and

a view renderer, communicatively coupled to the observer interface, to receive the viewpoint and direction of viewing, and to generate, based on the viewpoint and the direction of viewing, a pair of rendered view images of [the] a scene, wherein the scene is represented by [at least one] concentric mosaics.

48.   (Amended) A system [as recited in claim 47] comprising:

an observer interface to receive user input commands and identify a viewpoint and viewing direction based on the input commands; and

a view renderer, communicatively coupled to the observer interface, to receive the viewpoint and direction of viewing, and to generate, based on the viewpoint and the direction of viewing, a pair of rendered view images of the scene, wherein the scene is represented by a set of concentric circle mosaics based on a set of concentric circles, wherein the view renderer is further to generate values for a portion of one of the pair of rendered view images by interpolating between at least two captured images based on a constant distance to objects in the scene, and wherein the constant distance is calculated based on both a first distance between a center of the set of concentric circles and a nearest object of the scene and a second distance between the center of the set of concentric circles and a farthest object of the scene.